

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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# MULTIMEDIA UNIVERSITY

## FINAL EXAMINATION

TRIMESTER 2, 2019/2020

### BIC1024 – BUSINESS APPLICATIONS DEVELOPMENT

(All sections/Groups)

6 MARCH 2020  
9.00 a.m – 11.00 a.m  
(2 Hours)

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#### INSTRUCTIONS TO STUDENT

1. This question paper consists of 7 pages with 2 sections.
2. Choose and attempt **FOUR** out of **FIVE** questions in Section A and **ALL** questions in Section B. The distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

**SECTION A: Structured Questions (80 Marks)****Answer FOUR Questions only****QUESTION 1**

- (a) A team of programmers gathered to develop a business application for a client. The team has begun their work by understanding the problem faced by the client. Once the problem has been identified, the team has decided to move to the next stage of the project. Demonstrate what will be done in the next stage based on the program development cycle. (5 marks)
- (b) All business applications can be solved using a combination of sequence, decision, and loop structures. Draw a flowchart that indicates the combination of sequence and decision structures. (5 marks)
- (c) Solve the following expressions given the floating-point values  $x = 3$ ,  $y = 4$ , and  $z = 5$ . Assume all variables have been declared.
- (i)  $z \text{ MOD } x$  (2 marks)
  - (ii)  $3 * y + 2 * (z - x)$  (2 marks)
  - (iii)  $y^2 / 2$  (2 marks)
  - (iv)  $(x > 3) \text{ AND } (y == 4)$  (2 marks)
  - (v)  $\text{NOT } (x < (y + 1))$  (2 marks)

(Total: 20 marks)

**QUESTION 2**

- (a) A task is given to you to develop a module that makes decision on whether an individual is qualified to be called for an interview session for promotion purpose, given the individual's annual sales performance and years of employment. An individual is qualified to attend the interview if his/her sales performance is more than RM500,000. At the same time, the individual need to serve the company for at least 5 years. If the individual is qualified, the system will display a message stating "Qualified", else "Not Qualified" will be displayed.

Before coding the module, draw a flowchart to represent the above scenario by using multiple decisions approach. Name the module as "Decision". (10 marks)

- (b) Demonstrate the concepts of cohesion and coupling in structured modular programming. Illustrate diagramme(s) to depict these concepts. (10 marks)

(Total: 20 marks)

**Continued ...**

**QUESTION 3**

- (a) Your team are planning to assist the company to design and develop a business application that determines the sales price of the number of printers sold. The total price of sales will be determined based on the quantity purchased in one transaction. A 6% sales and service tax (SST) will be charged as well upon the total sales amount. The unit price for a printer based on the quantity purchased is as follows:

Quantity Purchased	Unit Price (RM)
1	288.00
5 to 9	250.00
10 and above	240.00

The sales price will be determine as follows:

$$\text{Total price} = \text{Quantity Purchased} * \text{Unit}$$

Before coding the program, developed a problem analysis chart for the above scenario. (10 marks)

- (b) Demonstrate how a binary search approach is conducted. (10 marks)

(Total: 20 marks)

**Continued ...**

**QUESTION 4**

The following is a list of group members' names and their current ages. Attempt the following task by using C language codes.

Name	Clark	Diana	Bruce	Wally	John	Carl
Age	22	21	23	25	20	19

- (a) Declare two arrays named as "Name" and "Age" with proper data types. Assigned the data above to its respective arrays. (4 marks)
- (b) There is a mistake in recording Diana's age. She should be 24 year olds. Write codes to update Diana's age. (2 marks)
- (c) John have left the group. He will be replaced by Ben who is 22 year olds. Write codes to update this information. (4 marks)
- (d) It seems that this list has not been updated in the past 2 years ago. All members' ages should be 2 years older. Write codes to increase all members' ages to 2 years older. Assume all needed variable(s) have been declared. (5 marks)
- (e) Display all members' names and ages on the screen as shown below. Assume all needed variable(s) have been declared. (5 marks)

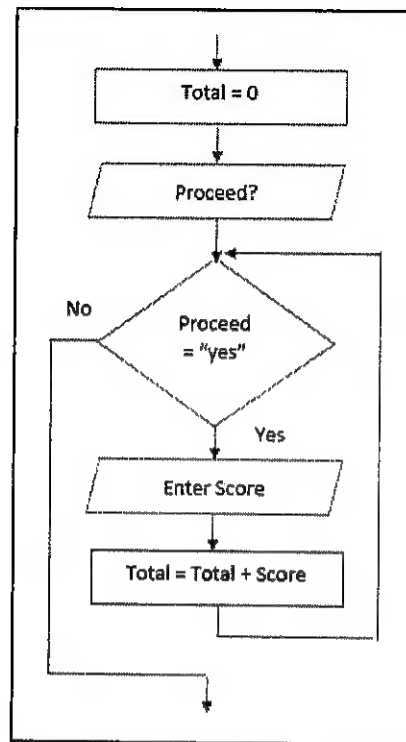
```
Clark    24
Diana    26
Bruce    25
Wally    27
Ben      24
Carl     21
```

(Total: 20 marks)

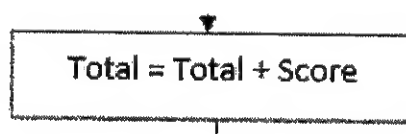
**Continued ...**

**QUESTION 5**

Based on the flowchart below, attempt the following questions.



- (a) Discover and explain the mistake in the above flowchart. (3 marks)
- (b) Make correction by redrawing the flowchart to solve or avoid the mistake. (3 marks)
- (c) Determine the meaning of the following instructions located in the symbol of the flowchart. (2 marks)



- (d) By using C language, write the codes to represent the corrected version of the flowchart above. Assume all variables have been declared. (12 marks)

(Total: 20 marks)

Continued ...

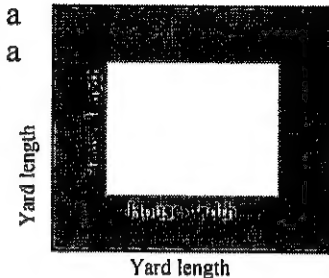
**SECTION B: Structured Questions (20 Marks)****Answer ALL questions****QUESTION 6**

The following pages shows a portion of C language codes for a business application that assist user in calculating the area of a rectangular space to put fake grass surrounding a rectangular house. This will assist user to estimate the amount of fake grass needed to cover the compound surrounding the house. The area of this space is obtained by using the following formula:

Area of yard = length of yard \* width of yard

Area of house = length of house \* width of house

Area of grass space = Area of yard - Area of house



The program is written by using structured modular programming approach. Attempt the following questions.

- (a) Draw a flowchart that represent the *decision()* module. (8 marks)
- (b) The *calculate\_grass()* module is missing from the source codes. This module will calculate the area of the grass area based on the formula given above. Develop this module to complete this business application. (6 marks)
- (c) Construct an interactivity chart that represent the source codes of this business application. (6 marks)

Continued ...

## Source Codes:

```
1  #include<stdio.h>
2
3  void input_yard(void);
4  void input_house(void);
5  int calculate_yard(void);
6  int calculate_house(void);
7  void decision(int, int);
8  void DisplayNotValid(void);
9  int calculate_grass(int, int);
10 void display_result(int, int, int);
11
12 int yard_length;
13 int yard_width;
14 int house_length;
15 int house_width;
16
17 main()
18 {
19     int yard_area;
20     int house_area;
21
22     input_yard();
23
24     input_house();
25
26     yard_area = calculate_yard();
27
28     house_area = calculate_house();
29
30     decision(yard_area, house_area);
31
32     return 0;
33 }
34
35 void input_yard(void)
36 {
37     printf("Enter yard length: ");
38     scanf(" %d", &yard_length);
39
40     printf("Enter yard width: ");
41     scanf(" %d", &yard_width);
42
43     return;
44 }
45
46 void input_house(void)
47 {
48     printf("Enter house length: ");
49     scanf(" %d", &house_length);
50
51     printf("Enter house width: ");
52     scanf(" %d", &house_width);
53
54     return;
55 }
56
```

Continued ...

## Source Codes:

```
57 int calculate_yard(void)
58 {
59     int m_yard_area;
60
61     m_yard_area = yard_length * yard_width;
62
63     return m_yard_area;
64 }
65
66 int calculate_house(void)
67 {
68     int m_house_area;
69
70     m_house_area = house_length * house_width;
71
72     return m_house_area;
73 }
74
75 void decision(int m2_yard_area, int m2_house_area)
76 {
77     int grass_area;
78
79     if(m2_yard_area < m2_house_area)
80     {
81         DisplayNotValid();
82     }
83     else
84     {
85         grass_area = calculate_grass(m2_yard_area, m2_house_area);
86
87         display_result(m2_yard_area, m2_house_area, grass_area);
88     }
89
90     return;
91 }
92
93 void DisplayNotValid(void)
94 {
95     printf("Invalid Entries!\n");
96     printf("Area of the grass can not be determined.");
97
98     return;
99 }
100
101 void display_result(int m3_yard_area, int m3_house_area, int m2_grass_area)
102 {
103     printf("Area of the Yard: %d \n", m3_yard_area);
104     printf("Area of the House: %d \n", m3_house_area);
105     printf("Area of the Grass: %d \n", m2_grass_area);
106
107     return;
108 }
```

End of Page